

ANNEX W

DEBRIS MANAGEMENT

CITY OF HOUSTON

APPROVAL & IMPLEMENTATION

Annex W

Debris Management

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RECORD OF CHANGES

Annex W

Debris Management

Change #	Date of Change	Entered By	Date Entered

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ANNEX W

DEBRIS MANAGEMENT PLAN

I. AUTHORITY

City of Houston Emergency Management Plan (hereinafter referred to as the Basic Plan).

II. GENERAL

The City of Houston Debris Management Plan provides a unified and coordinated approach by the Departments of Solid Waste Management (SWM), Public Works and Engineering (PW&E), Planning and Development (P&D) and Parks and Recreation (P&R) to respond to any major debris-generating disaster.

III. PURPOSE

To provide organizational structure, guidance, and standardized procedures for the clearance, removal and disposal of debris caused by a major debris-generating event.

To establish the most efficient and cost effective methods to resolve disaster debris removal and disposal issues.

To expedite debris response and recovery efforts that will provide visible signs of recovery designed to mitigate the threat to the health, safety and welfare of city residents.

To coordinate partnering relationships through communications and pre-planning with local, State and Federal agencies involved with debris management responsibilities.

To implement and coordinate private sector debris removal and disposal contracts to maximize cleanup efficiencies.

IV. EXPLANATION OF TERMS

CADD	Computer Aided Drafting and Design
CDM	City Debris Manager
DCAT	Debris Contract Administrative Team
DCZ	Debris Control Zones
DDM	Deputy Debris Manager
DMC	Debris Management Center
DMGC	Debris Management Consultant
DSI	Disposal Site Inspectors
EMC	Emergency Management Coordinator
EOC	Emergency Operations Center
FIT	Field Inspection Teams
GIS	Geographic Information System
LSI	Load Site Inspectors
M&ROW	Maintenance and Right-of-Way Division
NIMS	National Incident Management System
NPD	Neighborhood Protection Division
P&D	Department of Planning and Development
P&R	Department of Parks and Recreation
PIO	Public Information Officer
PW&E	Department of Public Works and Engineering
SWM	Department of Solid Waste Management

DMS Debris Management Site

V. SITUATION AND ASSUMPTIONS

A. Situation

Natural and man-made disasters such as hurricanes, tornadoes, flooding and explosions precipitate a variety of debris that include, but are not limited to, such things as trees and other vegetative organic matter, building/construction material, appliances, personal property, mud and sediment.

The quantity and type of debris generated from any particular disaster will be a function of the location and kind of event experienced, as well as its magnitude, duration and intensity.

The quantity and type of debris generated, its location, and the size of the area over which it is dispersed will have a direct impact on the type of removal and disposal methods utilized to address the debris problem, associated costs incurred and how quickly the problem can be addressed.

State agencies and local governments may have difficulty in locating staff, equipment, and funds to devote to debris removal, in the short- as well as long-term, following a major natural disaster.

B. Assumptions

A major natural disaster that requires the removal of debris from public or private lands and waters could occur at any time.

The amount of debris resulting from a major natural disaster will exceed the city's removal and disposal capabilities.

The city will contract for additional resources to assist in the debris removal, reduction, and disposal process.

The mayor of the City of Houston will declare that a local state of disaster exists and request state and federal assistance.

The governor will declare a state of emergency that will authorize state resources to assist in removal and disposal of debris. If the disaster exceeds both local and state resources, the governor will request a Presidential Disaster Declaration.

The President will approve a Presidential Disaster Declaration that will authorize federal resources to assist in removal and disposal of debris.

VI. CONCEPT OF OPERATIONS

A. Debris Management Staffing

The following are key Debris Management Center (DMC) staff positions and duties:

1. City Debris Manager (CDM)

The Director SWM will serve as the CDM and will provide overall supervision of a joint debris staff made up of personnel from SWM, PW&E and P&R. The joint debris staff will constitute the management element of the DMC. The operational arm of the DMC will be located at DSWM, Northwest Service Center, 1245 Judiway. If instructed by the mayor, the CDM will be located at the Emergency Operations Center (EOC) located in the Houston Emergency

Center (HEC) at 5320 North Shepherd Drive. If the CDM's presence is not required at the HEC, the CDM will be at a DSWM location.

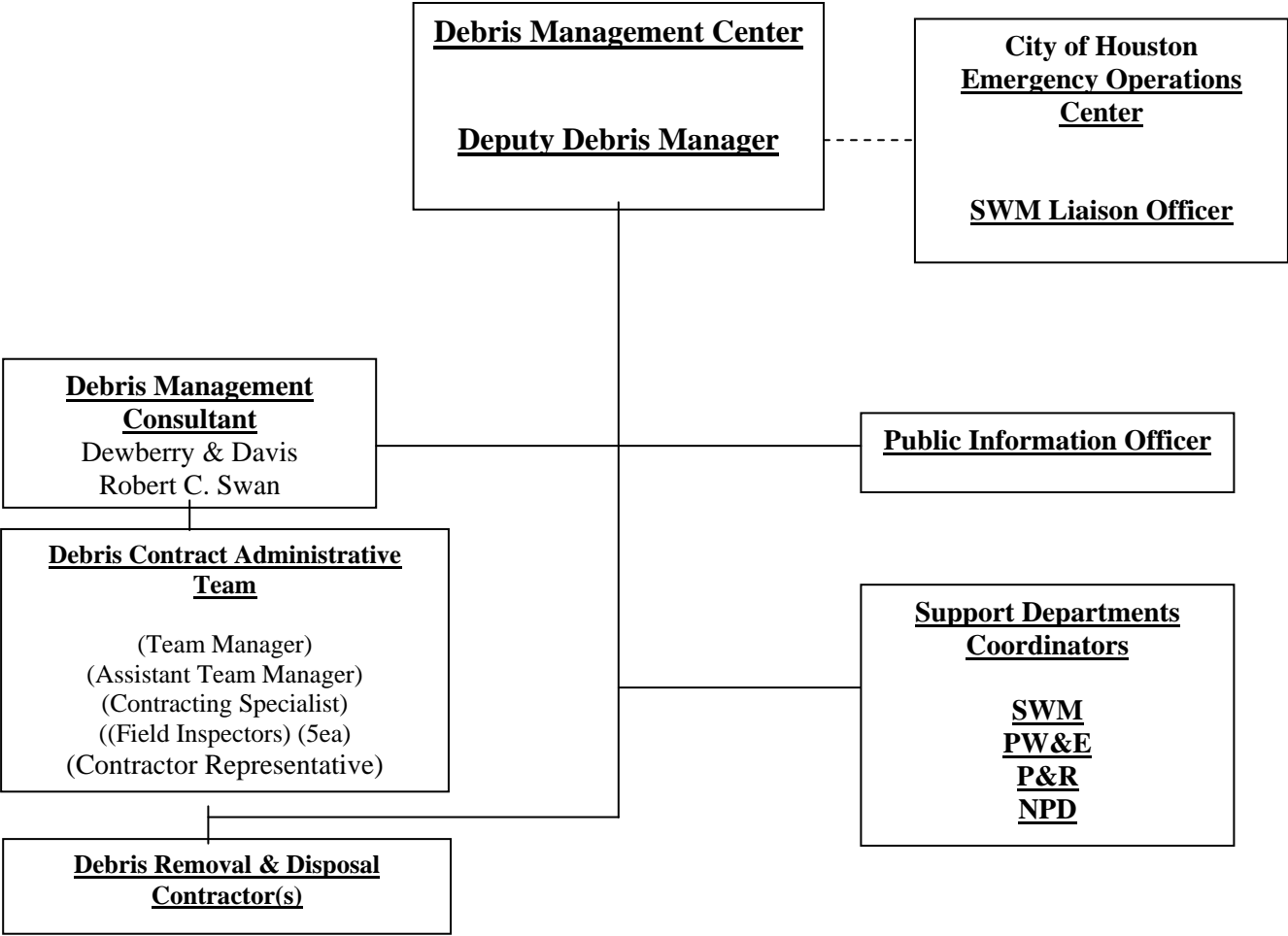
The CDM will be responsible for, but not limited to, the following with respect to any and all debris management issues:

- Keep the mayor briefed on the status of the debris cleanup operation via the EOC.
- Represent the city in all meetings with other government and private agencies involved with the debris cleanup operation.
- Inform the Emergency Management Coordinator (EMC) on all outstanding debris clearance, removal and disposal issues.
- Convene emergency debris coordinating meetings.
- Appoint a Deputy Debris Manager (DDM) responsible for daily operational control of the DMC.
- Ensure that the DMC is provided all needed administrative staff support.
- Provide media relations in coordination with the mayor's communications director.

B. National Incident Management System (NIMS)

The National Incident Management System (NIMS) will be used to manage and efficiently mitigate any such incident by integrating a combination of facilities, equipment, personnel, procedures, and communications into a common organizational structure. NIMS is used to organize both near-term and long-term field level operations for a broad spectrum of emergencies, from small to complex incidents, both natural and manmade. Description of the implementation is located within the Basic Emergency Management, Annex I - Public Information, Annex M – Resource Management and Annex N – Directions. Departmental policies and procedures are developed based on these principles.

**Debris Management Center
Organization Chart**



2. DDM

The DDM is responsible for overall operational control of the DMC staff. The DDM will receive current information on the severity of the disaster from the SWM liaison located at the EOC. All requests for debris clearing, removal or disposal from the EOC management will go through the SWM liaison to the DDM.

The DDM will evaluate the extent of the request and determine the operational impact and issue appropriate orders to the PW&E, SWM, P&R and P&D's NPD debris coordinators to effect cleanup. The debris coordinators, in turn, will execute their department's debris missions as defined in this plan and department standard operating procedures (SOP's).

The DDM will coordinate with the Debris Management Consultant (DMGC) on all debris removal and disposal contract activities.

The DDM will keep the CDM informed on all ongoing debris management operations on a daily basis through meetings and/or reports.

3. DMGC

The DMGC will provide advice to the CDM, the DDM and the DMC staff with respect to all aspects of debris management following a major debris-generating disaster.

The DMGC will keep the DDM informed of debris removal and disposal contractor cleanup progress and problems encountered or expected.

The DMGC will supervise the activities of the Debris Contract Administrative Team (DCAT) when activated.

4. SWM Debris Coordinator

The SWM debris coordinator will be responsible for coordinating all (SWM) debris cleanup actions involving heavy trash and/or SWM contractor personnel and equipment. Actions will focus on keeping track of debris control zone (DCZ) assignments and progress of the debris cleanup operations of SWM. The SWM debris coordinator will keep the DDM informed of cleanup progress and any problems encountered or expected. The SWM coordinator will keep track of all expenditures and costs relative to SWMD debris cleanup operations.

5. PW&E Debris Coordinator

The PW&E debris coordinator will be responsible for coordinating all PW&E debris clearance and cleanup actions involving PW&E personnel and equipment. Actions will focus on keeping track of Debris Control Zone (DCZ) assignments and progress of the initial debris clearance from public roadways and critical facilities. The PW&E debris coordinator will keep the DDM informed of cleanup progress and any problems encountered or expected. The PW&E coordinator will keep track of all expenditures and costs relative to their operations.

6. P&R Debris Coordinator

The P&R debris coordinator will be responsible for coordinating all P&R debris cleanup actions involving P&R and contractor personnel and equipment. Actions will focus on supporting PW&E and SWM with specialized equipment and debris removal from city parks and recreational facilities. The P&R coordinator will also keep track of DCZ assignments and progress of the debris cleanup operations. The P&R debris coordinator will keep the DDM informed of cleanup progress and any problems encountered or expected. The P&R coordinator will keep track of all expenditures and costs relative to their operations.

7. Neighborhood Protection Division (NPD) Coordinator

The NPD coordinator will be responsible for providing city inspectors at each contractor operated loading site within designated debris zones and at each temporary debris storage and reduction (TDSR) site and at each debris disposal landfill site. The purpose of the city inspectors will be to verify the location of debris loading and the quantity of debris moved and disposed of through the use of load tickets. NPD personnel will also be used to conduct initial debris estimates within designated debris zones. The NPD coordinator will keep the DDM informed of cleanup progress and any problems encountered or expected. The NPD coordinator will keep track of all expenditures and costs relative to their operations.

8. Public Information Officer (PIO)

The primary PIO will be provided by SWM and serve as the DMC's liaison to the mayor's communications director. PW&E, P&D and P&R will provide an alternate PIO, if required. The PIO will develop a proactive public information management plan in order to facilitate cleanup and removal. Emphasis will be placed on actions that the public can perform to expedite the cleanup process by separating burnable and nonburnable debris; segregating household hazardous waste; placing debris at the curbside; keeping debris piles away from fire hydrants and valves; reporting locations of illegal dump sites or incidents of illegal dumping and segregating recyclable materials.

VII. ORGANIZATION & ASSIGNMENT OF RESPONSIBILITIES

A. SWM

1. The director of SWM will serve as the CDM in the event of a major debris-generating event resulting from destructive winds or severe weather.
2. The CDM will oversee a special debris staff made up of personnel from SWM, P&D, PW&E and P&R. This staff constitutes the operating element of the joint DMC. The DMC will be located at the SMD's Northwest Service Center at 1245 Judiway.
3. As the CDM, the SWM director will be responsible for, but not limited to, the following with respect to all debris management issues:
 - Keep the mayor and EMC briefed on the status of the debris cleanup operation.
 - Represent the city in all meetings with other government and private agencies involved with the debris cleanup operation.

- Call any needed emergency debris coordinating meetings.
 - Ensure that the DMC is provided all needed staff support.
4. The SWM director will manage all non-debris emergency solid waste management activities through the existing SWM organizational structure.
 5. SWM will appoint a DDM responsible for daily operational control of the DMC.
 6. SWM will assign a SWM liaison to the EOC using established procedures. All information pertaining to debris clearing, removal, reduction or disposal will be forwarded from the EOC staff directly to the DDM who has daily operational control over the DMC staff.
 7. SWM will assign a SWM debris coordinator to the DMC staff for the purpose of coordinating and directing the use of SWM debris clearing and cleanup personnel and equipment according to existing standard operating procedures.
 8. SWM will supplement PW&E with personnel and equipment to assist in the Phase I debris clearance operations.
 9. SWM will establish and maintain the DMC that will be co-located at 1245 Judiway.

B. PW&E

1. The basic plan and annexes are based upon the concept that the emergency functions for various functional areas of PW&E involved in emergency management and operations will generally parallel day-to-day functions. Therefore, it is essential for PW&E to be prepared to carry out disaster response and short-term actions under the operational control of the DMC staff.
2. PW&E will assign a PW&E debris operations coordinator for the purpose of coordinating and directing the use of PW&E debris clearing and cleanup personnel and equipment according to existing standard operating procedures. SWM and P&R will supplement PW&E with personnel and equipment to assist in the Phase I debris clearance operations.
3. The PW&E debris operations coordinator will focus on assigning crews to clear debris according to established priorities in specific DCZ.
4. Personnel and equipment from SWM and P&R will supplement PW&E forces. Each of the departments will have a debris coordinator assigned to the DMC and all requests for assistance approved by the DDM will be coordinated with the appropriate SWM and/or P&R debris coordinator.
5. Phase I debris clearance operations will be executed by PW&E crews located at the following locations. Crews and equipment may be relocated to other locations based on the type of disaster.
6. Supporting elements from either SWM, P&D or P&R will report to the designated PW&E/SWM locations as directed by the DDM.

812 Gillette (Districts 1, 9 and 10)
747 Evergreen (District 2)
8002 Airline (District 3 and 5)
1700 East Crosstimbers (District 4, 12 and 13)
10560 Mykawa (District 6)
8430 Newcastle (District 7, 14 and 16)
803 Ennis (District 8)

22615 West Shorewood (District 11)
9003 North Main (District 15 and 17)
1506 Central (SWM)
15500 South Post Oak Road (SWM)
1245 Judiway (SWM)
5614 Neches (SWM)

7. Documentation of all expenses and costs associated with event.

C. P&R

1. The P&R will support SWM by providing specialized equipment and personnel to assist in Phase I and Phase II debris cleanup operations.
2. P&R will assign a debris coordinator for the purpose of coordinating requests for P&R and contractor personnel and equipment. Actions will focus on supporting PW&E and SWM with specialized equipment and debris removal from city parks and recreational facilities. The P&R coordinator will also keep track of debris zone assignments and progress of the debris cleanup operations. The P&R debris coordinator will keep the DDM informed of cleanup progress and any problems encountered or expected.

D. Planning & Development Department (P&D)

In addition to providing the resources of the NPD and performing those duties, P&D is also responsible for providing Geographic Information System (GIS)/ Computer Aided Drafting and Design (CADD) support to the DMC staff.

E. DCAT

DCAT is a contractor operation under the city's debris management contract. The director of SWM will activate this team by task order for training and in advance of a potential debris-generating event.

F. Pre-Storm Administrative Actions

The DMGC will be requested to conduct an annual workshop session with the contractors and other DMC staff to review the debris management plan procedures and to ensure that the DCAT operation works smoothly.

G. Pre-Storm Activation Actions

The City of Houston DMGC will be notified by the city upon notice of a Category 1 or above hurricane or other situation that could generate large volumes of debris. The DMGC will establish presence and coordinate with the director of SWM should the situation dictate the activation of the DCAT. The DMGC will notify all DCAT members and place them on alert status to be prepared to move into the Houston area within 12 hours after receipt of a notice to proceed from the City of Houston. The DCAT will function as part of the DMC.

H. Post-Storm Actions

1. The DMGC will provide overall supervision of the DCAT. A team manager will exercise daily operational control of the DCAT staff. A DCAT liaison will locate at the EOC and will work directly with the CDM.
2. The DCAT staff will recommend assignment of disaster debris removal and disposal contractors based on the city's sixteen (16) DCZ according to information received from the SWM liaison located at the EOC and directions from the CDM or DDM.
3. The DCAT staff will administer and provide oversight of the disaster debris removal and disposal contractor's efforts. Specific actions will include the following:
 - Planning, DMS site inspection, quality control and other contract administration functions.
 - Receive and review all city DSI's verified debris load tickets.
 - Make recommendations on city and contractor work assignments and priorities based on the 16 DCZ.
 - Report on progress and prepare status briefings
4. The DCAT will have a qualified hazardous materials specialist available with extensive experience in post-disaster cleanup of hazardous household waste and facilities with lead-based paint and/or asbestos if required.
5. The DCAT will supervise FIT made up of DCAT and city NPD personnel to observe contractor activities. The FIT will act as the "eyes and ears" for the DCAT to ensure that safety requirements stated in the contracts are closely monitored.
6. The DCAT will also provide training for the city's LSI and DSI to ensure that accurate load quantities are being properly recorded on pre-printed load tickets.
7. The CDM will coordinate the completion of all reporting documents required by Federal Emergency Management Agency to receive public assistance funding.

VIII. DEBRIS MANAGEMENT PHASES

The city is divided into 16 DCZ for control purposes. The quantity of potential debris by a Category 4 Hurricane for each zone is shown in the following table. Appendix 1 is a map of the city showing each of the DCZ.

Debris Control Zones	Estimated Number Of Single Family Homes	Estimated Debris
1	11,789	684,264 CY
2	19,995	1,016,293 CY
* 3	34,862	1,432,425 CY
4	19,307	1,033,148 CY
5	21,270	1,071,455 CY
* 6	19,338	931,507 CY
7	27,039	1,259,395 CY
8	17,583	581,348 CY
9	27,207	1,249,379 CY
* 10	26,931	1,144,611 CY
* 11	24,834	1,058,084 CY
12	19,261	777,357 CY
13	29,551	1,389,831 CY
* 14	19,187	983,884 CY
* 15	1,357	61,575 CY
* 16	16,126	775,412 CY
Total	335,637	15,449,968 CY

Category 4 Hurricane Debris Estimating Table

A detailed estimating spreadsheet for each Debris Zone is provided as appendix 10.

* Current SWM collection contracts active in these zones.

A. Phase I: Debris Clearance Operations

Debris clearance operations will be accomplished by PW&E's M&ROW supplemented by personnel and equipment from SWM and P&R. Their primary mission will be to clear debris from at least one lane on all primary and secondary roads to expedite the movement of emergency service vehicles such as fire, police and medical responders. The city has been divided into sixteen DCZ to control debris-clearing operations.

The Planning & Development Department's recovery teams will conduct initial zone by zone windshield surveys to identify the type of debris and to estimate amounts of debris on the roadways. The results of the windshield surveys will be coordinated between the EOC and the DMC.

Actions will be initiated by the DDM to implement Phase I debris-clearing procedures once a debris zone has been surveyed and the results reported through the SWM liaison. Recovery teams will need to revisit heavily damaged zones and conduct more detailed debris estimates to determine if additional private, state or federal assistance will be required.

Debris clearing priorities will be established by the CDM in coordination with the EOC to ensure that debris clearing is conducted in an orderly and effective manner in order to protect public health and safety according to the following:

First Priority: Clear debris from key roads in order to provide access for emergency vehicles and resources into the impacted area based on DCZ boundaries.

Second Priority: Provide access to critical facilities pre-identified in appendix 2. Initial debris damage assessment reports will be the basis for identifying roadways into the following critical facilities based on DCZ boundaries:

1. Fire and police facilities
2. Critical medical facilities
3. Essential government facilities
4. Evacuation centers
5. Designated shelters
6. Schools
7. Other government facilities

B. Phase II: Disaster Debris Removal and Disposal

The general concept of debris removal operations includes multiple, scheduled passes of each site, location, or right-of-way as directed by the DMC staff. This manner of scheduling debris removal allows residents to return to their properties and bring debris to the edge of the right-of-way as property restoration progresses.

Phase II operations involve the removal and disposal of curbside debris. City forces may be able to deal with removal and disposal issues without the assistance of outside contractors. When outside contractors are utilized, the city will provide field inspection teams as well as load site and disposal site inspectors to oversee contractor operations.

1. City Debris Removal and Disposal Operations

The DDM and staff will coordinate all debris removal and disposal operations from the DMC.

SWM will collect and haul mixed debris from their assigned DCZ to pre-identified private landfill sites according to ongoing city contracts. A listing of all city approved private landfills for disaster debris is provided as appendix 3. Clean woody debris will be hauled to the nearest DMS site (see appendix 4).

PW&E will focus on the removal of debris from critical public facilities from their assigned DCZ and haul it to pre-identified private landfill sites according to ongoing city contracts (appendix 3). Clean woody debris will be hauled to the nearest DMS site (appendix 5).

P&R will continue to provide support to SWM and PW&E with specialized equipment and operators as required. P&R will begin to collect debris from parks and recreation facilities from their assigned DCZ based on priorities established by the DDM. Mixed debris will be hauled to pre-identified private landfill sites according to ongoing city contracts. Clean woody debris will be hauled to the nearest DMS site (see appendix 3).

SWM, PW&E and P&R drivers will obtain a certified scale ticket and/or load ticket for each load of debris deposited at a private landfill. The scale ticket/load ticket will be turned into their supervisor at the end of each day. The supervisor

will forward the scale tickets daily to the DDM. The scale tickets/load tickets will be the verification documentation for private landfill invoices.

SWM and their ongoing contractors will pickup garbage according to current procedures, routes and removal schedules.

The city's pre-event hazardous waste contractor will collect eligible household hazardous waste resulting from the disaster. The DDM will identify household hazardous waste pickup locations according to DCZ. The hazardous waste contractor will have a representative located at the DMC.

Center Point Energy utility crews will handle all utility related debris such as power transformers, utility poles and other utility company material.

2. Contractor Debris Removal and Disposal Operations

The CDM or his/her authorized representative will be in contact with the firm(s) holding pre-event debris removal and disposal contract(s) and advise them of impending conditions. The pre-event contract is designed to have a qualified contractor(s) remove and lawfully dispose of all natural disaster generated debris, excepting hazardous and industrial materials. Debris removal will be limited to designated city streets, roads, and other rights-of-way based on the extent of the disaster and includes all debris brought to the edge of the right-of-way by residents within designated DCZ.

The city recognizes the economy of disaster debris disposal through the use of local DMS sites designated for volume reduction of clean woody debris and limited amounts of mixed debris. The city has pre-designated DMS sites for the sole purpose of temporarily storing and reducing clean woody debris and/or mixed debris. The contractor will operate the DMS sites made available by the city. The contractor will be responsible for all site setup, site operations, rodent control, closeout and remediation costs as defined in the debris removal and disposal contract. A listing of all approved DMS sites is provided as appendix 4.

Contractor(s) will conduct operations as stipulated in the relevant contracts and as further directed by the CDM and DDM.

3. NPD Loading Site and Disposal Site Inspectors

PWE's NPD will provide city loading site and DSI. The DSI will be assigned to each contractor loading site within designated DCZ. They will initiate the load tickets (see appendix 5) that verify that the debris being picked up is eligible under the terms of the contract. DSI will be stationed at each TDSR and landfill disposal site for the purpose of verifying the quantity of material being hauled by the disaster debris removal and disposal contractor through the use of load tickets.

The contractor shall construct and maintain inspection stations at each DMS site and landfill disposal site. A DSI will be located at each inspection station to verify the load and estimate the volume in cubic yards.

The inspection stations will consist of an inspection tower with furniture and portable sanitary facilities.

The DSI will estimate the cubic yards of debris in each truck entering the contractor's selected DMS site or landfill disposal site and will record the estimated quantity on pre-numbered debris load tickets. The contractor will only

be paid based on the number of cubic yards of material deposited at the disposal site as recorded on the debris load tickets.

The contractor will be paid based on the quantity of eligible debris hauled per truckload. One part of the debris load ticket will be given to the truck driver and the other retained by the DSI. The truck driver's portion of the load ticket will be turned in daily to their supervisor. The DSI's copy will be turned in daily to the DCAT manager. Payment for hauling debris will only be approved upon presentation of the duplicate debris load ticket with the contractor's invoice. Contractor invoices will be processed by the DCAT within seven days of receipt.

4. Field Inspection Teams

The DCAT and P&D's NPD will provide FIT responsible for monitoring all contractor debris removal and disposal operations. The FIT will periodically inspect each DMS site to ensure that operations are being followed as specified in the debris removal and disposal contract with respect to local, state and federal regulations and the DMS site baseline checklist (see appendix 7). Each FIT will submit a daily written report to the DCAT or DDM manager outlining their observations with respect to the following:

- Is the contractor using the site properly with respect to layout and environmental considerations using the DMS site baseline checklist provided at appendix 6?
- Has the contractor established lined temporary storage areas for ash, household hazardous wastes and other materials that can contaminate soils and groundwater?
- Has the contractor established environmental controls in equipment staging areas, fueling and equipment repair areas to prevent and mitigate spills of petroleum products and hydraulic fluids?
- Are plastic liners in place under stationary equipment such as generators and mobile lighting plants?
- Has the contractor established appropriate rodent control measures?
- Are burn sites constructed and operating according to appendix 7?
- Has the contractor established procedures to mitigate:
 - Smoke** – Are the incineration pits constructed properly and being operated according to the contract statement of work?
 - Dust** – Are water trucks employed to keep the dust down?
 - Noise** – Have berms or other noise abatement procedures been employed?
 - Traffic** – Does the DMS site have a suitable layout for ingress and egress to help traffic flow?

Field inspection reports will also include observations at loading sites and the locations of any illegal dumping sites.

IX. DMS SITE PREPARATION AND CLOSEOUT PROCEDURES

The contractor will be responsible for preparing and closing out DMS sites according to specification in the debris removal and disposal contract. The following is a guide for the city's FIT and other interested agencies.

A. Site Preparation

The topography and soil/substrate conditions should be evaluated to determine best site layout. When planning site preparation, think of ways to make restoration easier. For example, if the local soils are very thin, the topsoil can be scraped to bedrock and stockpiled in perimeter berms. Upon site closeout, the uncontaminated soil can be spread to preserve the integrity of the tillable soils.

B. Site Operations

Lined temporary storage areas should be established for ash, household hazardous waste, fuels, and other materials that may contaminate soils and ground water. Plastic liners should be placed under stationary equipment such as generators and mobile lighting plants. These actions should be included as a requirement in the contract scope of work. If the site is also an equipment storage area, fueling and equipment repair should be monitored to prevent and mitigate spills of petroleum products and hydraulic fluids

Be aware of and lessen the effects of operations that might irritate occupants of neighboring areas. Establishment of a buffer zone can abate concerns over smoke, dust, noise, and traffic.

Consider on-site traffic patterns and segregate materials based on planned volume reduction methods.

Operations that modify the landscape, such as substrate compaction and over excavation of soils when loading debris for final disposal, will adversely affect landscape restoration.

Debris removal/disposal should be viewed as a multi-staged operation with continuous volume reduction. There should be no significant accumulation of debris at temporary storage sites. Instead, debris should be constantly flowing to burners and grinders, or recycled with the residue and mixed construction and demolition materials going to a landfill.

C. DMS Site Closeout Inspection

Each DMS site will eventually be emptied of all material and be restored to its previous condition and use. The contractor is required to remove and dispose of all mixed debris, construction and demolition debris, and debris residue to approved landfills. Appropriate city inspectors will monitor all closeout activities to ensure that the contractor complies with the debris removal and disposal contract. Additional measures may be necessary to meet local, state, and federal environmental requirements because of the nature of the DMS site operation.

D. DMS Site Closeout Planning

The contractor must assure the city that all sites are properly remediated. There will be significant costs associated with this operation as well as close scrutiny by the local press and environmental groups. Site remediation will go smoothly if baseline data collection and site operation procedures are followed.

E. DMS Site Closeout Steps:

1. Remove all debris from the site.
2. Conduct an environmental audit/assessment.
3. Develop a remediation/restoration plan, approved by the appropriate environmental agency.
4. Execute the plan.
5. Obtain acceptance from the landowner.

F. DMS Site Remediation.

During the debris removal process and after the material has been removed from each of the debris sites, environmental monitoring will be needed to close each of the sites. This is to ensure that no long-term environmental contamination is left on the site. The monitoring should be done on three different media: ash, soil, and groundwater.

- **Ash.** The monitoring of the ash should consist of chemical testing to determine the suitability of the material for either agricultural use or as a landfill cover material.
- **Soil.** Monitoring of the soils should be by portable inspection methods to determine if any of the soils are contaminated by volatile hydrocarbons. The contractors may do this if it is determined that hazardous material, such as oil or diesel fuel was spilled on the site. This phase of the monitoring should be done after the stockpiles are removed from the site.
- **Ground Water.** The monitoring of the ground water should be done to determine the probable effects of rainfall leaching through either the ash areas or the stockpile areas.

G. DMS Site Closeout Coordination.

The contractor will coordinate the following closeout requirements through the DCAT staff:

- Coordinate with local and state officials responsible for construction, real estate, contracting, project management, and legal counsel regarding requirements and support for implementation of a site remediation plan.
- Establish an independent testing and monitoring program. The contractor is responsible for environmental restoration of both public and leased sites. The contractor will also remove all debris from sites for final disposal at landfills prior to closure.
- Reference appropriate and applicable environmental regulations.
- Prioritize site closures.
- Schedule closeout activities.
- Determine separate protocols for ash, soil and water testing.
- Develop decision criteria for certifying satisfactory closure based on limited baseline information.
- Develop administrative procedures and contractual arrangements for closure phase.
- Inform local and state environmental agencies regarding acceptability of program and established requirements.

- Designate approving authority to review and evaluate contractor closure activities and progress.
- Retain staff during closure phase to develop site-specific remediation for sites, as needed, based on information obtained from the closure checklist.

A copy of the TDSR site closure checklist is provided as appendix 8.

X. PRIVATE PROPERTY DEBRIS REMOVAL

Dangerous structures should be the responsibility of the owner to demolish in order to protect the health and safety of adjacent residents. However, experience has shown that unsafe structures will remain because of the lack of insurance or absentee landlords. Care must be exercised to ensure that structures are properly identified through the NPD.

The DDM will coordinate with NPD regarding:

- Demolition of private structures.
- Removing debris from private property.
- Local law and/or code enforcement agencies.
- Historic and archaeological sites.
- Qualified environmental contractors to remove hazardous waste such as asbestos and lead-based paint.
- Abandoned vehicles.
- Receipt of right of entry agreements with landowners (see appendix 9).

XI. ADMINISTRATION AND SUPPORT

A. Administration

1. All city departments will document personnel, equipment, load tickets and material resources used to comply with this plan. Documentation will be used to support reimbursement from any federal assistance that may be requested or required.
2. All city departments and supporting contractors will ensure 24-hour staffing capability during implementation of this plan, if the emergency or disaster requires.

B. Support

1. Planning and Development Department
Provide GIS/CADD backup support on a priority as needed basis.
2. Houston Fire Department
 - a. Respond to fire at DMS sites.
 - b. Respond to request to investigate and handle hazardous materials incidents.
3. Houston Police Department
Assist in monitoring illegal dumping activities.
4. Houston health department
 - a. Assists in DMS site investigations.
 - b. Assistance as necessary on all environmental issues.

XII. ANNEX DEVELOPMENT & MAINTENANCE

The director of SWM is responsible for the annual update and maintenance of this plan. It will be the responsibility of each tasked department to update its respective portion of the plan and ensure any limitations and shortfalls are identified and documented, and work-around procedures developed, if necessary.

XIII. REFERENCES

- City of Houston Emergency Management Plan
- Annex K to the City of Houston Emergency Management Plan

XIV. APPENDICES

Appendix 1: Debris Zone Index Map

Appendix 2: Debris Control Zone (1-16) Maps

Appendix 3: Critical Facilities Listing

Appendix 4: Permitted Processing and Disposal Facilities

Appendix 5: Listing of Debris Management Sites

Appendix 6: Sample Debris Load Ticket

Appendix 7: Debris Management Site Baseline Data Checklist

Appendix 8: Environmental Controls Checklist for Air Curtain Pit Burners

Appendix 9: Debris Management Site Closure Checklist

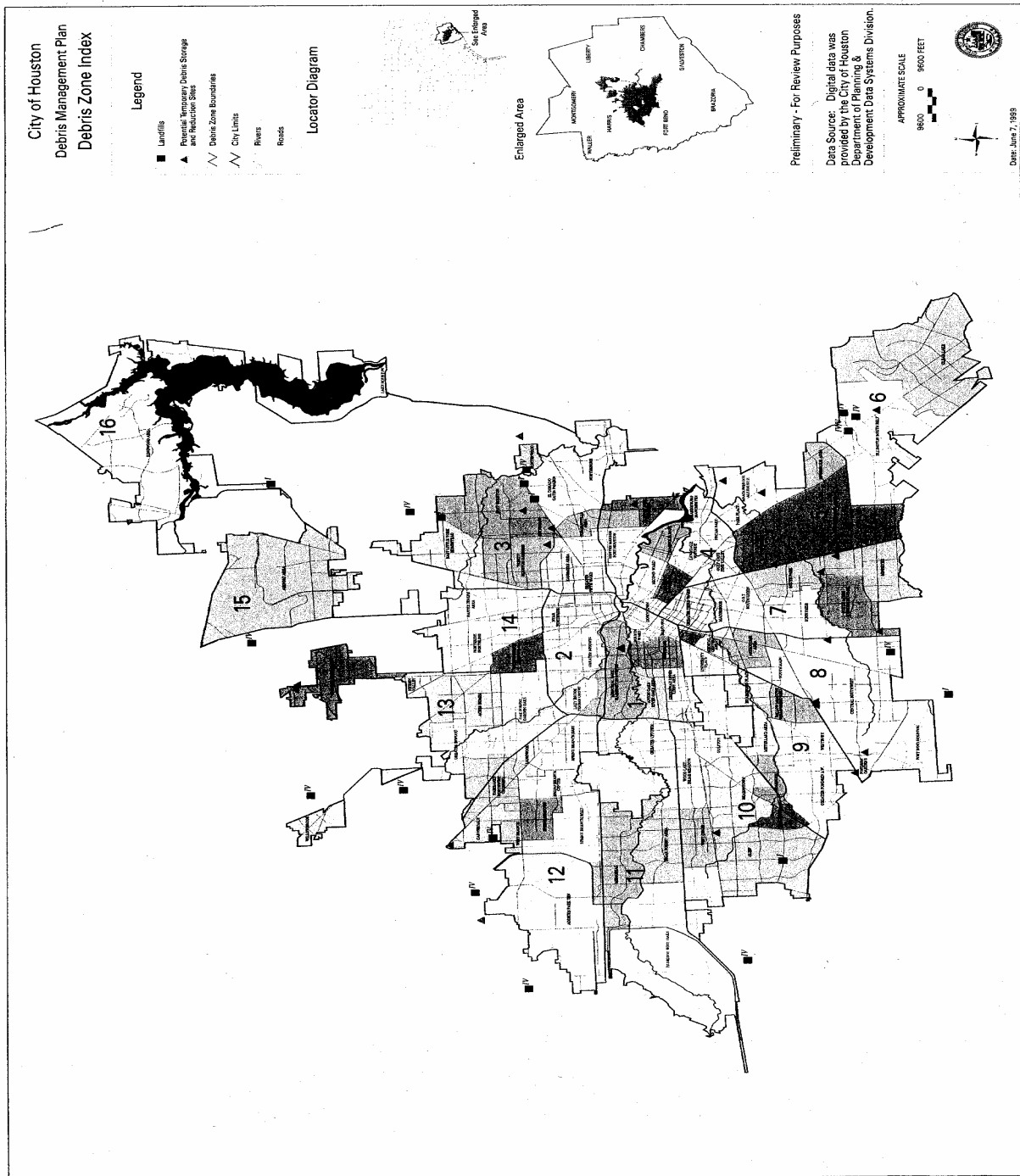
Appendix 10: Right of Entry Agreement

Appendix 11: Debris Zone Estimation Spreadsheets

City of Houston

Debris Zone Index Map

Appendix 1



City of Houston

Debris Management Plan

Appendices 2-11

Appendices 2-11 have not been included as part of this Annex. Copies are on file with the Solid Waste Management Department and Houston Division of Emergency Management.